

Date: Monday, 4/23/2007 1:35:48 PM
User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : SKID TUBE ASSEMBLY
Job Number : 31973	
Estimate Number : 10023	
P.O. Number : <i>N/A</i>	Part Number : D205634041
This Issue : 4/23/2007 S.O. No. <i>N/A</i>	Drawing Number : D2580 REV C
Prsht Rev. : NC	Project Number : N/A
First Issue : <i>N/A</i>	Drawing Revision : C
Previous Run : 31972	Material : <i>N/A</i>
Written By : <i>[Signature]</i>	Due Date : 5/10/2007
Checked & Approved By : <i>[Signature]</i>	Qty: 1 Um: Each
Comment: Est Rev. N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ	
Est Rev. O 06.02.28 Added paperwork EC	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	DC	DOCUMENT CONTROL
-----	----	------------------



Comment: DOCUMENT CONTROL

Photocopy D205-634 bluefile & type labels per PPP D205-634 CHG001

KS 07.05.01 (1)

2.0	D25001190	Ext'n -1" Beam Tube 4"
-----	-----------	------------------------



Comment: Qty.: 1.0400 Each(s)/Unit Total : 1.0400 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2500-1-190	Skid Tube Extrusion	<i>B 29602</i>

JD 7-5-2

3.0	D2596	205 Web
-----	-------	---------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2596	205 Web	<i>B 32098</i>

JD 7-5-18

4.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
-----	----------------	-------------------------



Comment: LANDING GEAR RESOURCE 1

- 1- Inspect mat'l D2500-1-190 for damage
- 2-Cut D2500-1-190 per Dwg D2580 if necessary Debur ends
- 3-Acid etch and Alodine tube per QSI 005 4.1
- 4-Drill pilot holes using drill jig DT 8149(Do not use cutting fluid)



JD 7-5-2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 4/23/2007 1:35:48 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 31973

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

5-Open holes to 0.500" as per Dwg D2580 without cutting fluid

6-Countersink holes as per Dwg D2580 without cutting fluid

7-Deburr and blow out all chips from inside of tube

8-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting

Pick:

Qty Part Number Description Batch

A/R Sikaflex-291 m103 561

Sikaflex expire date: 7-10-1

Start Time: 9:00 Date: 7-5-18

Fin Time: 8:00 Date: 7-5-24 EL

JD 7-5-2

JD 7-5-18

5.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

EL 7-5-24

6.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Deburr ends after cutting. Remove alodine from around holes

JD 7-6-4

7.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

BE 07-06-06

8.0

D25763

Step (Machining Detail)



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number Description Batch

1 D2576-3

Step

B29486

BE 07-06-06

9.0

D2579

Crossbolt Spacer



Comment: Qty.: 20.0000 Each(s)/Unit Total : 20.0000 Each(s)

Pick:

Qty Part Number Description Batch

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 4/23/2007 1:35:48 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 31973

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description:

20

D2579

Spacers

BZ1108 BE 07-06-06

10.0

LARGE FAB 1

LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1

1-Prepare tube for welding D2576-3 Step Remove alodine as required.

BE 07-06-06

2-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R

Aluminum Rod

M103794 BE 07-06-06

3-Weld crossbolt spacers D2579 as per Dwg. D2580 and QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R

Aluminum Rod

M103794 BE 07-06-06

4-Grind welds as per Dwg D2580 Grind flush ridge made from bending

PR 1 7-6-7

5-Drill holes for wearplates using DT 8217 Open holes to 19/64", adjust stopper not to hit web. Deburr

6-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Deburr holes

7-Drill pilot holes for aft cap using DT 8215 Open holes to #6 Drill bit. Deburr

8-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

PMC 07-06-07

11.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

M 07/06/11

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

Job 13

13.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1


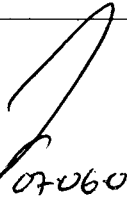
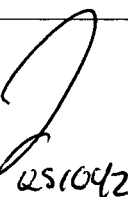

Pressure wash as per QSI 005

all 1 M/L 07-06-28

41

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: 2 Date: 07/07/10
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07-06-06	10.0	2 holes were slightly miss aligned from the web → tube, causing an interference with the flange web; x-bolt spacers. R.C. web was installed fwd too much, human error.		Qualize the 2 holes by 0.030", deburr & touch-up with Alodine. Install x-bolt spacers & weld per Q51004.	BE 07-06-06 BE 07-06-06			

NOTE: Date & initial all entries

Date: Monday, 4/23/2007 1:35:48 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 31973

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

14.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

M 10/1/44

BL/M-h

07-07-03

①

15.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

FL

07/07/05

①

16.0

D25771

Wearplate Fwd



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

1

D2577-1

Wearplate

B31212

17.0

D25773

Wearplate Aft



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

1

D2577-3

Wearplate

B30551

18.0

D25775

Wearplate, Centre



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

1

D2577-5

Wearplate

B31254

19.0

ALS71032130

Insert



Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)

Pick:

Qty

Part Number

Description

Batch

44

ALS7-1032-130

Inserts

M1103618

07-07-05

①

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 4/23/2007 1:35:48 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 31973

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

20.0

AN960JD10L

Washer



Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
4 4	AN960JD10L	Washer	M103641

21.0

AN34A

Bolt



Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
44	AN3-4A	Bolt	* 2 batches -> M10348 (x31) -> M104817 (x13)

22.0

D25941

Plug



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

plug

Batch: B30140

23.0

D25943

O-Ring



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

o-ring

Batch: B27168

24.0

D2855

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Cap

Batch: B29608

25.0

AN35A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Bolt

Batch: B15205

22 07-07-05 @

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: PD Date: 01/07/10
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 4/23/2007 1:35:48 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: SKID TUBE ASSEMBLY

Job Number: 31973

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description:

26.0

AN960JD10L

Washer



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Washer

Batch: M103641

07-07-05

①

27.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Install inserts & wearplates as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R Sikaflex-291

M104732

Sikaflex expire date: 07-09

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R Sikaflex-291

M104732

Sikaflex expire date: 07-09

B31973

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

M104733

FL

Batch:

07/07/06

①

28.0

QC5

INSPECT WORK TO CURRENT STEP



En 07/07/06



Aft Plugs installed

Comment: Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

29.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D205-634-041

Location:

PPP Rev:

Rev H 7/2/07 SP

30.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07/07/10

Job Completion



07/07/10

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



RELEASED
98/09/17 DS

DESIGN DHF	DRAWN BY JP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DHF	APPROVED JP	DRAWING NO. D2580	REV. C SHEET 1 OF 2
DATE 98.08.26		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	

QTY	Part Number	Description
X	D2580-041	SKIDTUBE ASSEMBLY
*	D2500-1	EXTRUSION
1	D2596	205 WEB
1	D2575	AFT CAP
1	D2576-3	STEP
20	D2579	CROSS BOLT SPACER
16	D2594-1	PLUG
16	D2594-3	O-RING
1	D2577-1	WEARSHOE
1	D2577-3	WEARSHOE
1	D2577-5	WEARSHOE
44	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or ALS4-1032-130	INSERT
46	AN3-4A	BOLT
46	AN960JD10L	WASHER

00 08.28
UP 00.03.28

EFFECTIVE DEOs
98/12/14
DEO 9124
DEO 9183

GENERAL NOTES:

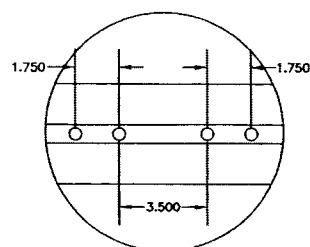
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) LENGTH OF D2500-1 EXTRUSION BEFORE BENDING = 190 INCHES *
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (44 PLACES) AFTER FINISH. INSTALL AN3-4A BOLTS AND AN960JD10L WASHERS WITH SIKAFLEX-241.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:

ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

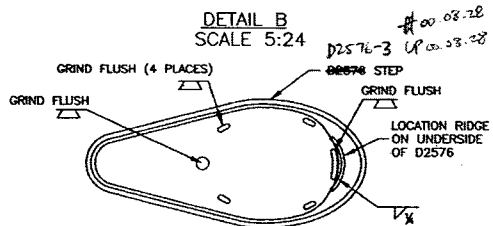
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 21973

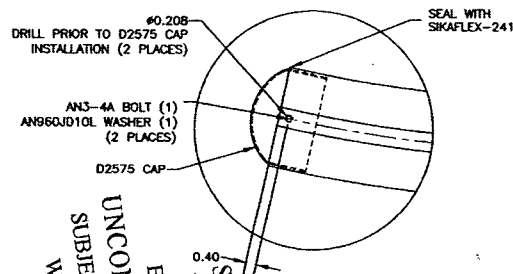
DETAIL A
SCALE 5:24



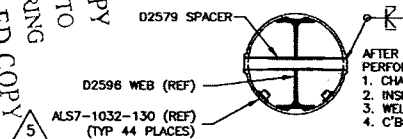
DETAIL B
SCALE 5:24



DETAIL C
SCALE 5:24

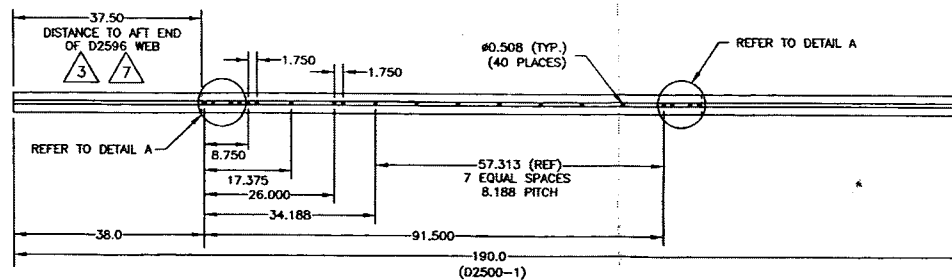


SECTION D-D
SCALE 5:24

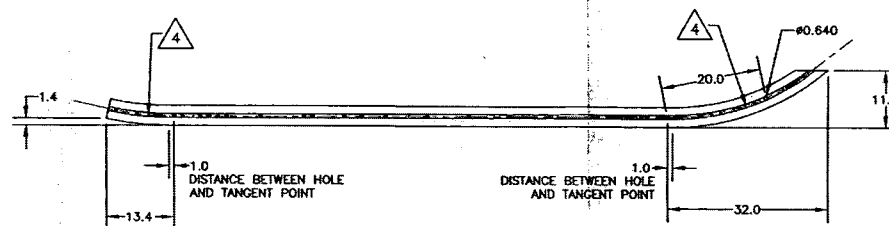


AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:
1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO #0.437 X 1.00 DEEP

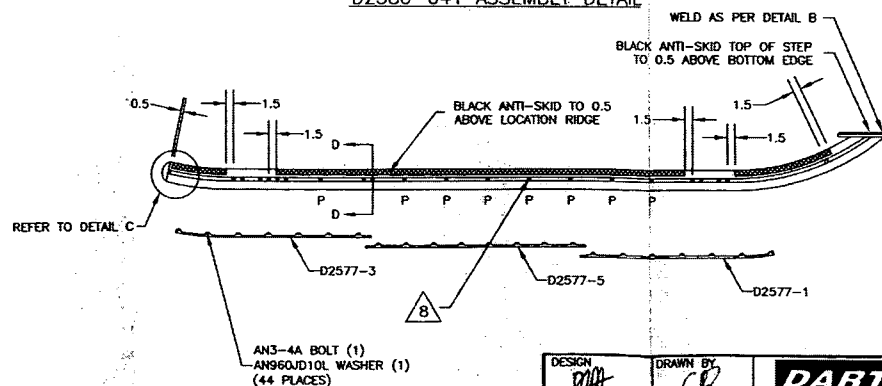
D2580-1 DRILLING DETAIL



D2580-1 BENDING AND CUTTING DETAIL



D2580-041 ASSEMBLY DETAIL



RELEASED
98/09/17 DS

DESIGN D2580	DRAWN BY CP	DART DART AEROSPACE LTD MARKHAM, ONTARIO, CANADA	REV. C
CHECKED D2580	APPROVED DS	DRAWING NO. D2580	SHEET 2 OF 2
DATE 98.08.26		TITLE 205 SKIDTUBE ASSEMBLY	SCALE 1:24

NO. 118

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name Baachy Elliott
Joint Welding Procedure Tig
Part number and Job number A205634041 / B31973

TEST WELDS REQUIRED

BASE METAL Alum WELDING PROCESS Tig
Penetration Complete ☐ Partial ☒ Single Weld ☒ Double Weld ☐
Current AC ☒ DC ☐ Backing YES ☐ NO ☒

	Position	Vertical	Down <input type="checkbox"/>	Up <input type="checkbox"/>
Sheet Groove	1G <input type="checkbox"/>	2G <input type="checkbox"/>	3G <input type="checkbox"/>	4G <input type="checkbox"/>
Tube Groove	1G <input type="checkbox"/>	2G <input type="checkbox"/>	5G <input type="checkbox"/>	6G <input type="checkbox"/>
Sheet Fillet	1F <input type="checkbox"/>	2F <input type="checkbox"/>	3F <input type="checkbox"/>	4F <input type="checkbox"/>
Tube Fillet	1F <input type="checkbox"/>	2F <input type="checkbox"/>	4F <input type="checkbox"/>	5F <input type="checkbox"/>

Crossbolt Spacer Welded into Skidtube

TEST RESULTS

Visual Pass ☒ Fail ☐
Penetration Pass ☒ Fail ☐
Crossbolt Spacer Pass ☒ Fail ☐

The above named individual is qualified in accordance with AWS D17.1.2001 to weld

Date of Test Coupon 07/06/04

Qualifier Lewid Kunt